ENDAT-K1001

User's Manual

For ENDAT-K1001 PCB ver. A3

Aug 10, 2011

Document version: A3

Copyright Notice

The content of this manual has been checked for accuracy. The manufacturer assumes no responsibility for any inaccuracies that may be contained in this manual. ***The manufacturer reserves the right to make improvements or modification to this document and/or the product at any time without prior notice.*** No part of this document may be reproduced, transmitted, photocopied or translated into any language, in any form or by any means, electronic, mechanical, magnetic, optical or chemical, without the prior written permission of the manufacturer.

AMD is registered trademark of AMD Technology Incorporation

GEODE LX is registered trademark of AMD Technology Incorporation

Realtek is registered trademark of Realtek Technologies Inc.

Multiscan is a trademark of Sony Corp of America

IBM, EGA, VGA, PC/XT, PC/AT, OS/2 and PS/2 are registered trademarks of International Business Machines Corporation

Intel is a registered trademark of Intel Corporation

VIA is registered trademark of VIA Technology Incorporation

Plug and Play is registered trademarks of Intel Corporation

Microsoft, Windows and MS-DOS are trademarks of Microsoft Corporation

Award is a trademark of Phoenix Software Inc.

PCI is a registered trademark of PCI Special Interest Group

Other product names mentioned herein are used for identification purpose only and may be trademarks and/or registered trademarks of their respective companies.

Installation Notice

The manufacturer recommends using a grounded plug to ensure proper motherboard operation. Care should be used in proper conjunction with a grounded power receptacle to avoid possible electrical shock. All integrated circuits on this motherboard are sensitive to static electricity. To avoid damaging components from electrostatic discharge, please do not remove the board from the anti-static packing before discharging any static electricity to your body, by wearing a wrist-grounding strap. The manufacturer is not responsible for any damage to the motherboard due to improper operation.

Specification:

Model	ENDAT-K1001
System Chipset	AMD RS780E+SB710 (TDP 15+4.5 Watt)
CPU Supporting	Support AMD SEMPRON / ATHLON / ATHLON X2 / PHENOM X3 / PHENOM X4 AM2/AM2+/AM3 socket CPU
Memory	- 2 x SODIMM sockets - Support DDR2-800/667/533/400 up to 8GB
Ethernet	2 x REALTEK RTL8111B Gigabit Ethernet Controllers
Graphic Chip	- Integrated ATI Radeon™ HD 3200 GPU - Support onboard 128MB Side-port Memory (optional) - Support Microsoft® DirectX 10, Shader Model 4.0, OpenGL 2.0 - Hardware Decode Acceleration for H.264, VC-1, and MPEG-2
CRT interface	Up to 2048x1536 (4:3) or 2560x1440 (16:9)
DVI interface	Dual link DVI port support up to 2560x1600
LVDS panel interface	Support 18/24/36/48 bit LVDS (Up to 1920 x 1200 with 2 channels) with backlight control
Duo View	CRT+LVDS, CRT+DVI, DVI+LVDS
Serial Ports	2 x Serial Ports (2.0mm Box Header)
Watch Dog Timer	ITE IT8718F-S on-chip support 1 to 255 seconds / minutes
Digital I/O	8 bit bi-direction un-buffer GPIO
SATA	6 x SATA II (5 x SATA + 1 x eSATA) ports with AHCI (hot plug) support
RAID	Support RAID 0, 1, 10 by 4 SATA II devices
USB	8 x USB2.0 (6 x connector + 4 x header)
AUDIO	REALTEK ALC888 7.1+2 Channel High Definition Audio Codec with 6 HD AUDIO jack + 2 front panel AUDIO jack
Expansion	1 x PCIe 2.0 x16 slot 1 x Mini PCIe (single lane) socket
I/O Ports	1 x PS/2 KB/MS connector
	1 x DVI-D + VGA double deck connector
	2 x LAN + USB double deck connectors
	1 x eSATA + USB double deck connector
	6 x HD AUDIO phone jack
Power Supply	Single +12~24V DC / ATX power
Form Factor	MINI-ITX (170mm x 170mm) with 8 Layers PCB

ENDAT-K1001 USERS MANUAL

UNICORN COMPUTER CORP.

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION 6

1-1. FEATURES 7
1-2. UNPACKING 8
1-3. ELECTROSTATIC DISCHARGE PRECAUTIONS 8
1-4. MOTHERBOARD LAYOUT 9

CHAPTER 2. SETTING UP THE MOTHERBOARD 10

2-1. JUMPERS AND CONNECTORS 10
2-2. INSTALLING MEMORY 22
2-3. GRAPHIC MEMORY 22
2-4.WATCH DOG TIMER 22
2-5. DIGITAL I/O 24
2-6. LCD Backlight ON/OFF Control 25
2-7. LCD Brightness Control 26

CHAPTER 3. AMI BIOS SETUP 27

3-1. Main 28
3-2. Advanced 28
3-3. Boot 33
3-4. Security 34
3-5. Chip 35
3-6. Power 38
3-7. Exit 39

UNICORN

CHPATER 4. VGA, LCD AND DRIVERS 40
4-1. VGA FEATURE 40
4-2. DRIVER UTILITY INSTALLATION GUIDE 41

APPENDIX A: FLASH MEMORY UTILITY 42

APPENDIX B: LIMITED WARRANTY 43

UNICORN

Chapter 1. Introduction

In order to optimize the overall system and graphics performance of embedded system in diverse application, ENDAT-K1001 system board provides the ultimate solution by integrating with ATI Radeon™ HD 3200 DirectX® 10 GFX engine in AMD RS780E system chipset. The ATI Radeon™ HD 3200 (M72-based) graphics core employs a unified shader architecture to deliver optimal 3D performance across the whole spectrum of 3D applications. This future-proof core ensures compatibility with both current and upcoming 3D applications. ENDAT-K1001 not only provide the ideal solution for Hi-End Gaming system, but also can be adapted in various applications such as digital signage, POS, kiosks, networking systems, control terminals and other embedded systems.

ENDAT-K1001 is designed with AMD AM2/AM2+/AM3 high performance multi-core CPU. The memory sub-system supports two DDR2-400/533/667/800 MHz SODIMM socket up to 8GB of DDR2 chips. Memory controller is integrated by AMD CPU to optimize the system performance and stability.

ENDAT-K1001 reserved 128MB local graphics memory (Side-Port memory) by optional feature and it improve the graphic performance up to 10% to 15% (with UMA + Side-Port mode). Graphic engine support Shader Model 4.0, OpenGL 2.0, Dedicated UVD hardware for H.264, VC-1, and MPEG-2 decode.

ENDAT-K1001 provides the CRT, dual channels DVI, LVDS panel as standard display interface to offer a cost effective platform for customer. Also, ENDAT-K1001 reserved the interface to extend the 2nd CRT, 2nd DVI and 2nd LVDS by sharing the 16 lanes PCIE slot.

ENDAT-K1001 provides the standard ATX power supply or single DC input by optional (+12V to +24V) feature. The single DC input will optimize the whole system cost, assembly and cable distribution.

The ideal solutions of ENDAT-K1001

- POS system
- KIOSK
- Vehicle system
- Interactive system
- Gaming system
- Embedded system equipment

1-1. Features

Basic Feature:

- High performance CPU and GFX with cost effective platform.
- Support AMD AM2/AM2+/AM3 socket CPU.
- Two DDR2 SODIMM sockets support DDR2-400/533/667/800 up to 8GB system memory.
- ATI Radeon™ HD 3200 DirectX® 10 GFX engine with 128MB local memory (optional feature) and UMA mode (shares system memory up to 1GB)
- 7.1 channels + front panel HD AUDIO
- 6 x SATA II (5 x SATA + 1 x eSATA) ports with AHCI compliant
- RAID 0, 1, 10 support by 4 SATA II devices
- 1 x PCIe 2.0 x16 slot and 1 x single lane mini PCIe socket
- 10 x USB 2.0 support
- ATX power input (Standard version), or Wide range (+12V to +24V) DC input (optional feature).
- 1 x LVDS connector support brightness control

Software Support

- Drivers for major embedded operating systems: Linux, Windows XP, Windows XP embedded, Windows7 and Windows CE 6.0.

Ordering information:

1. ENDAT-K1001: Standard version. (ATX)

2. ENDAT-K1001W: Wide range DC input. (+12V~+24V)

UNICORN

1-2. Unpacking

The motherboard comes securely packaged in a sturdy cardboard shipping carton. In addition to the User's Manual, the motherboard package includes the following items:

- ENDAT-K1001 System Board
- SATA Cables
- LCD cable **(Optional)**
- CD with Driver utilities for on-board VGA and LAN adapter

If any of these items are missing or damage, please contact the dealer from whom you purchase the motherboard. Save the shipping material and carton in the event that you want to ship or store the board in the future.

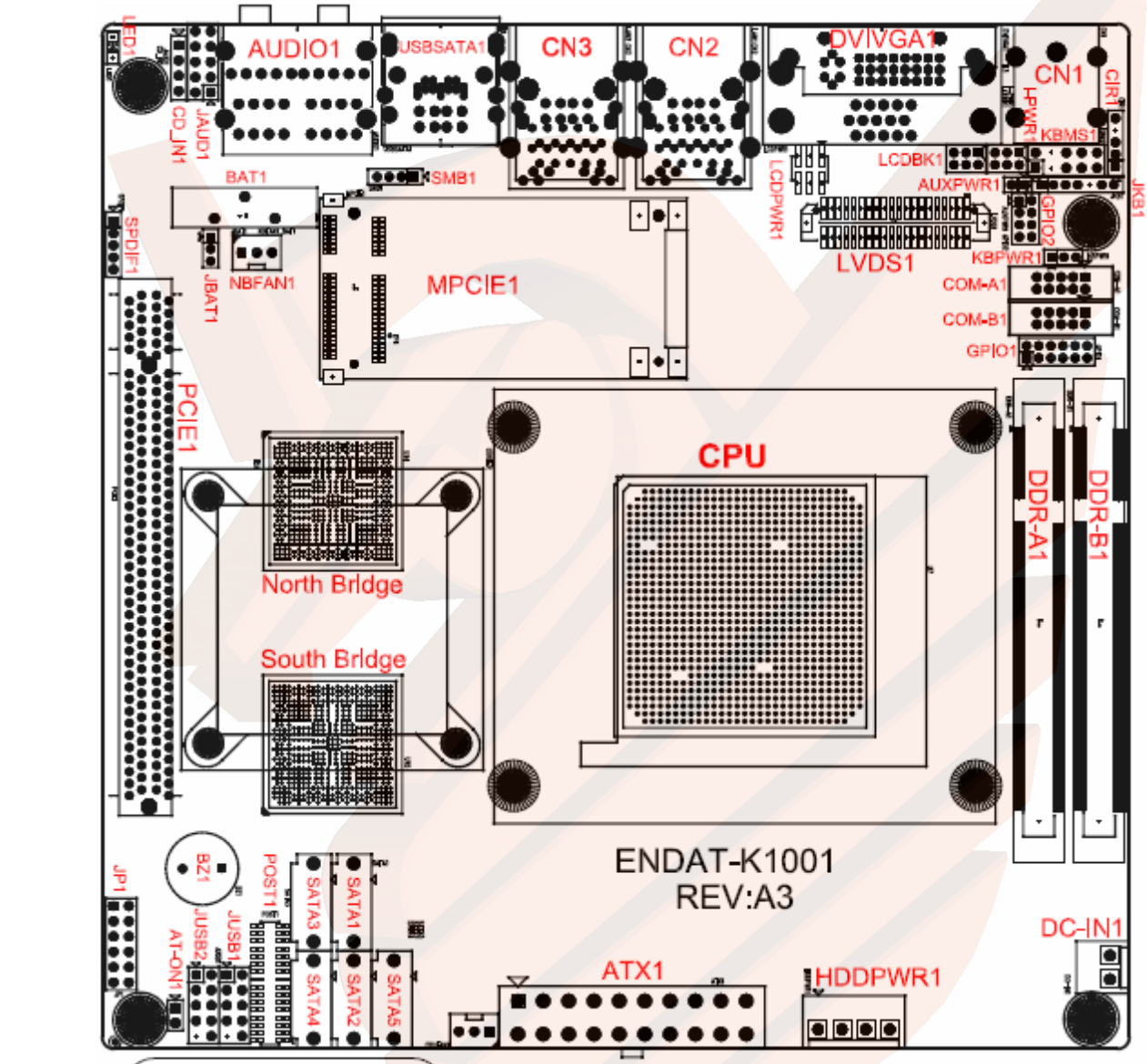
Note: Leave the motherboard in its original package until you are ready to install it!

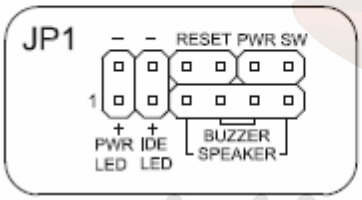
1-3. Electrostatic Discharge Precautions

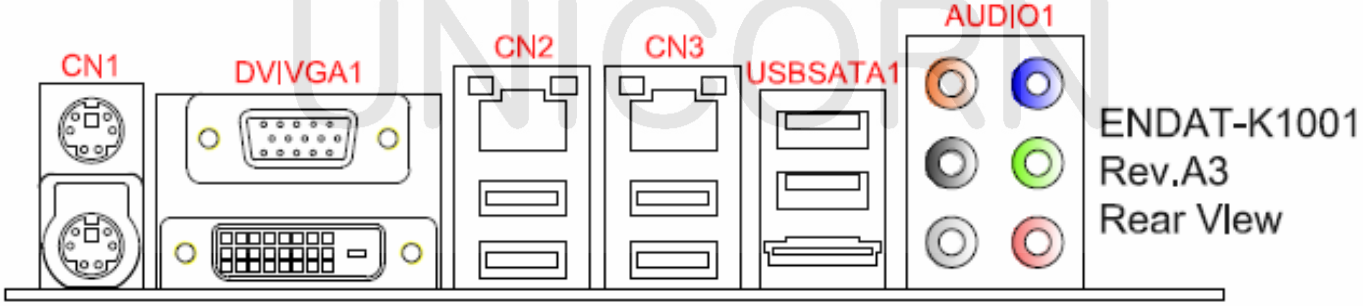
Make sure you properly ground yourself before handling the motherboard, or other system components. Electrostatic discharge can easily damage the components. Note: You must take special precaution when handling the motherboard in dry or air-conditioned environments.

UNICORN

1-4. MOTHERBOARD LAYOUT.







Chapter 2. Setting up the Motherboard

2-1. Jumpers and Connectors

Connectors Overview:

Function	Connectors
ATX Power Connector	ATX1
DC Power Supply Connector	DC-IN1
HDD Power Connector	HDDPWR1
CPU Socket	U7
DDR2 SO-DIMM Socket	DDR-A1, DDR-B1
PCIE 16X Slot	PCIE1
Mini PCIE Socket	MPCIE1
PS/2 KB/MS Connector	CN1
CRT/DVI Connector	DVIVGA1
LVDS Connector	LVDS1
LAN1/USB Connector	CN2
LAN2/USB Connector	CN3
eSATA/USB Connector	USBSATA1
HD AUDIO jack	AUDIO1
Cooling Fan Connectors	NBFAN1, CPUFAN2
SATA Connectors	SATA1,2,3,4,5

UNICORN

Box Headers, Pin Headers Overview:

Function	Connectors
PS/2 KB/MS Header	KBMS1
External PS/2 Device Header (KB)	JKB1
COM1 / 2 Box Header	COM-A1 (COM1)
	COM-A2 (COM2)
USB Ports Header	JUSB1, JUSB2
AUDIO Headers	JAUD1
SPDIF Header	SPDIF1
SMBus Header	SMB1
Header for Case Panel	JP1
Digital I/O Header	GPIO1
Reserved Power for LCD (+3.3V)	AUXPWR1
Inverter Header (with brightness control)	LCDBK1

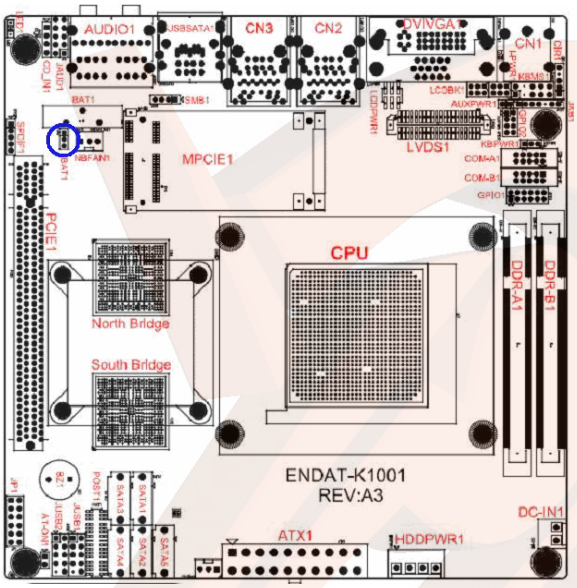
Jumpers Overview:

Function		Connectors
LVDS	**LCD Voltage Select**	LCDPWR1
	Backlight Voltage Select	I-PWR1(Pin2,4,6)
	Inverter ON/OFF Level Select	I-PWR1(Pin1,3,5)
	LCD Brightness Select	GPIO2 **(HW Control)**
Clear CMOS		JBAT1
Header for Case Panel		JP1
HDD LED		JP1: Pin 1(-), Pin 2(+)
External Speaker		JP1: Pin 5(+), Pin 11(-)
Buzzer On/Off		JP1: Pin 7, Pin 9
Hardware Reset Switch		JP1: Pin 6, Pin 8
ATX Power Supply On/Off Switch		JP1: Pin 10, Pin 12
Power LED		JP1: Pin 1(+), Pin 2(-)
Keyboard Power Select		KBPWR1

Please double-check the insertion and orientation of the LCD cable before applying power. Improper installation will result in permanent damage LCD panel.

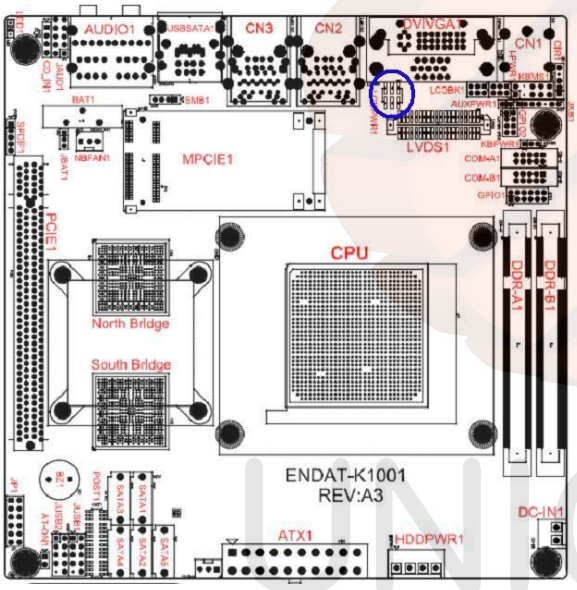
Part 1: Onboard Jumpers

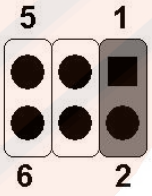
JBAT1: CMOS Data Clear (1x3, 2.0mm)



Pin 1-2 *	Normal
Pin 2-3	Close for clear CMOS

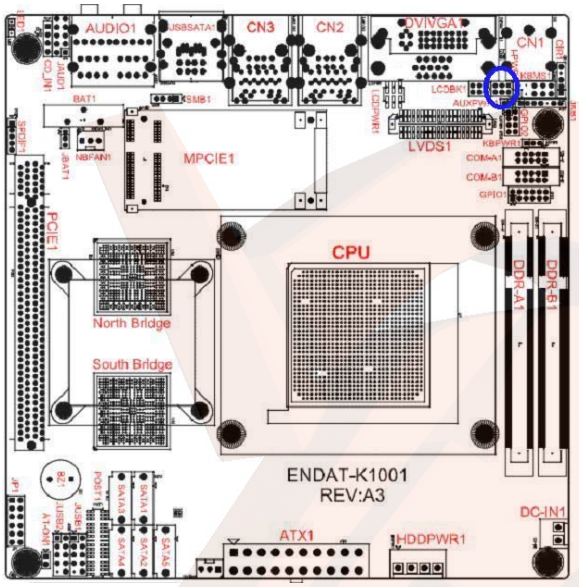
LCDPWR1: LCD Voltage Select (2x3, 2.0mm)



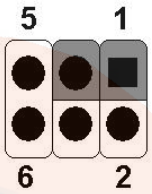


LCDPWR1	Voltage
1-2*	**+3.3V ***
3-4	**+5V**
5-6	**+12V**

I-PWR1: Inverter ON/OFF Level Select (2x3 with 2.0mm)
I-PWR1: LCD Backlight Voltage Select (2x3 with 2.0mm)

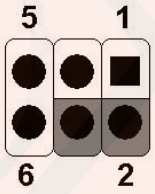


Inverter ON/OFF Level Select



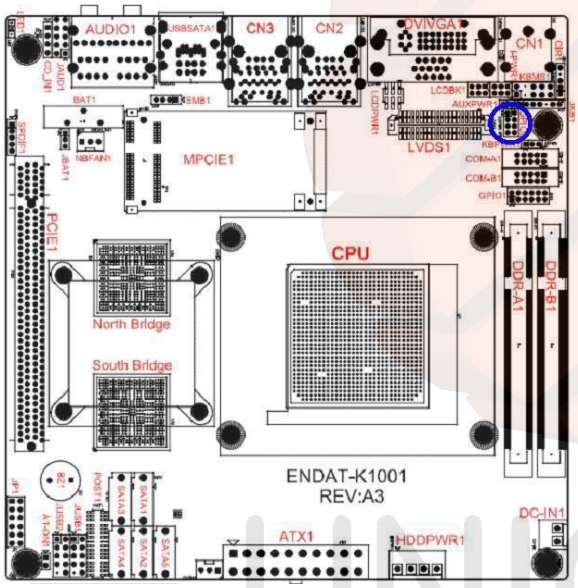
I-PWR1	Voltage
1-3	**+3.3V***
3-5	**+5V**

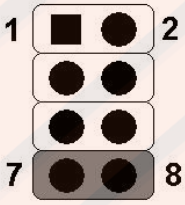
LCD Backlight Voltage Select



I-PWR1	Voltage
2-4	**+12V***
4-6	**+5V**

GPIO2: LCD Brightness Select (2x4 with 2.0mm)

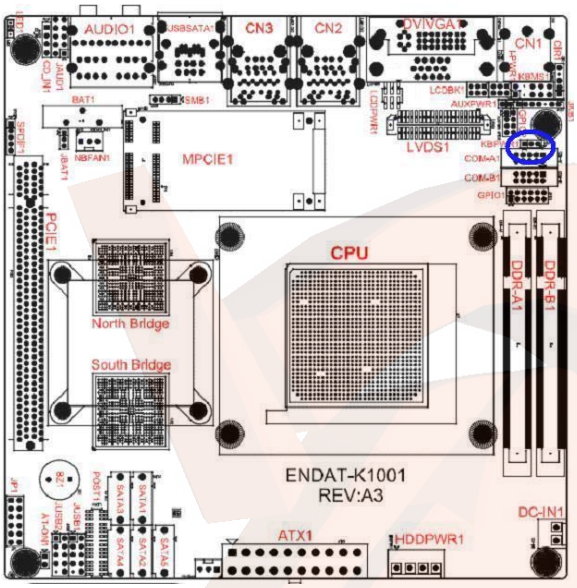


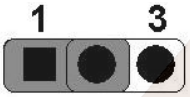


Pin No.	Voltage (V)
1-2	+2.5V
3-4	+1.70V
5-6	+1.10V
1-2, 3-4	+1.25V
1-2, 5-6	+0.85V
3-4, 5-6	+0.72V
Close All	+0.63V
Open all	+5.0V
7-8	0V

Notice1: The above voltage will effect to the pin-3 of LCDBK1 only
Notice2: GPIO2 must open all jumpers for S/W control

KBPWR1: Keyboard Power Select

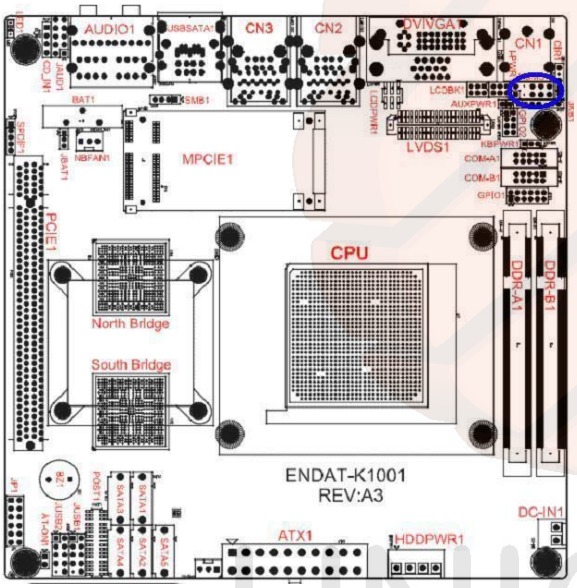


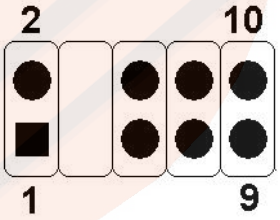


I-PWR1	Voltage
1-2	**+5V Standby ***
2-3	**+5V**

Part 2: Onboard Connectors and Headers

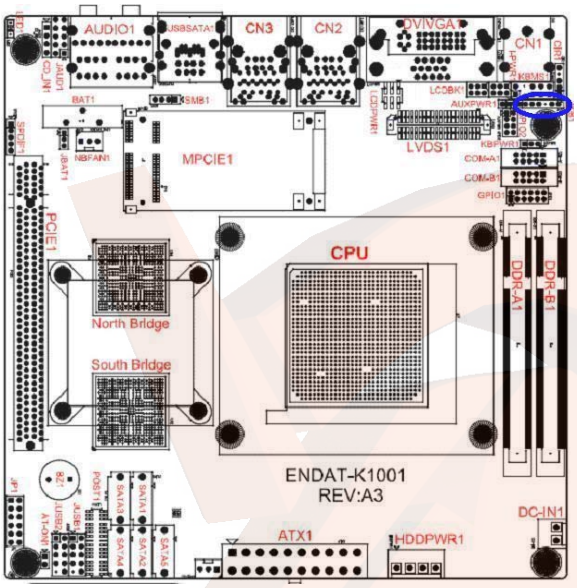
KBMS1: PS/2 Keyboard / Mouse Header (2x5 with 2.54mm)





Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	KB Data	**2**	MS Data
3	KEY	**4**	KEY
5	GND	**6**	GND
7	+5V(DC)	**8**	+5V(DC)
9	KB_CLK	**10**	MS_CLK

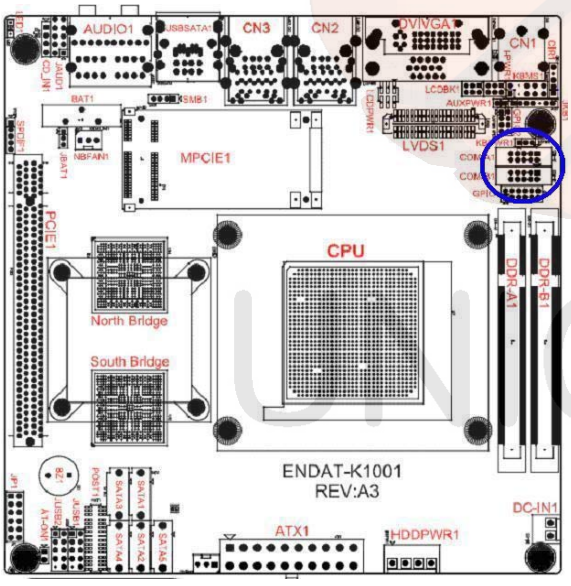
JKB1: External PS/2 Device Header (1x7 with 2.0mm)

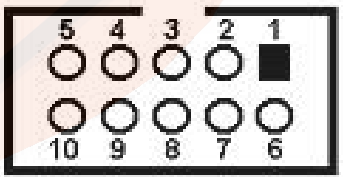


Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	KB Data Out	**2**	KB Data In
3	KB Clk Out	**4**	KB Clk In
5	Key	**6**	+5V(DC)
7	GND		

COM-A1 (COM1) / COM-B1 (COM2):

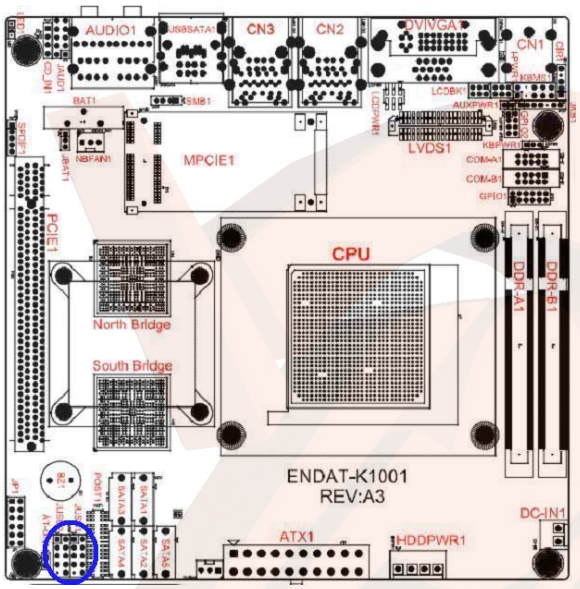
COM port Box Headers (2x5 with 2.0mm)

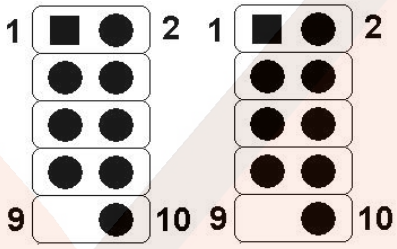




Pin No.	Function	Pin No.	Function
1	DCD	**6**	DSR
2	RXD	**7**	RTS
3	TXD	**8**	CTS
4	DTR	**9**	RI
5	GND	**10**	N.C.

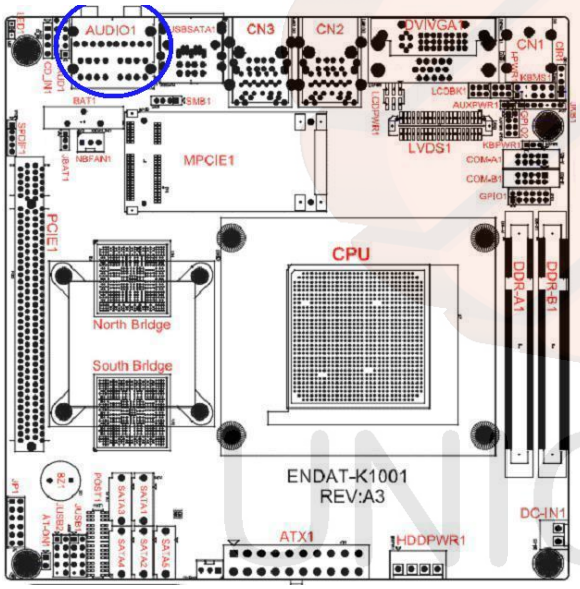
JUSB1, JUSB2: Pin Header for USB port (2x5 with 2.54mm)

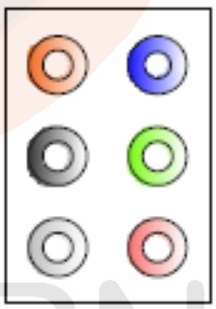




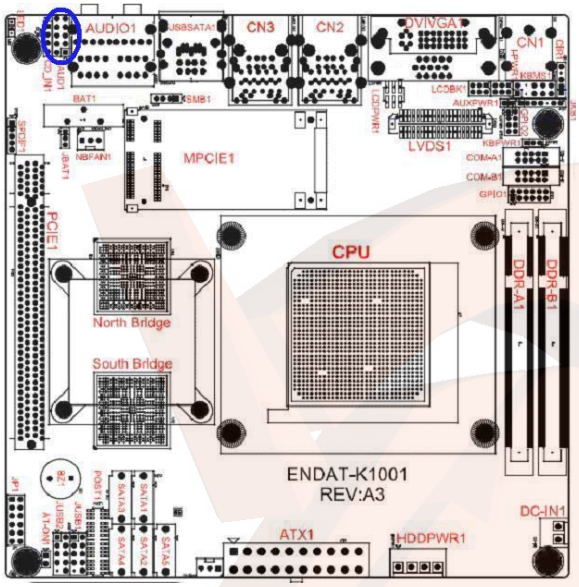
Pin No.	Function	Pin No.	Function
1	USB_VCC	**2**	USB_VCC
3	USBD4/6-	**4**	USBD5/7-
5	USBD4/6+	**6**	USBD5/7+
7	USB_GND	**8**	USB_GND
9	KEY	**10**	USB_GND

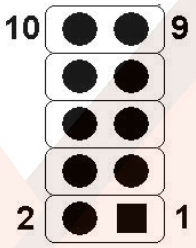
AUDIO1: 6 Ports Audio Jack



CEN/LFE		**LINE IN1**
SURR		**FRONT**
SIDE		**MIC1**

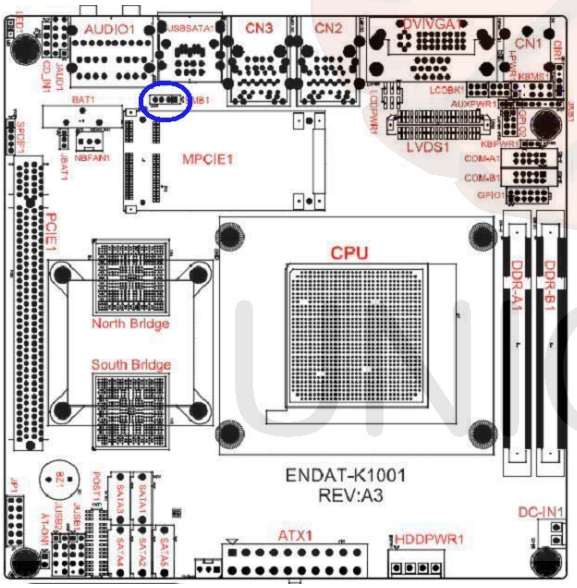
JAUD1: AUDIO Headers for Front panel (2x5 with 2.54mm)





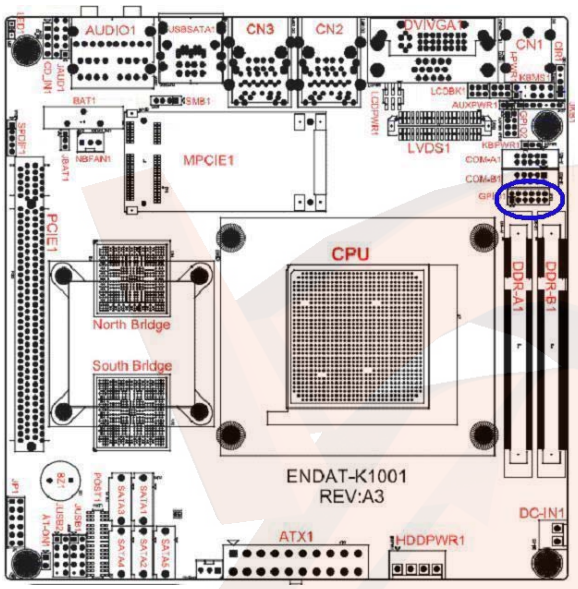
Pin No.	Function	Pin No.	Function
1	MIC2-L	**2**	GND_AUD
3	MIC2-R	**4**	NA
5	LINE2-R	**6**	MIC2-Detect
7	Front Panel Detect	**8**	NA
9	LINE2-L	**10**	LINE2-Detece

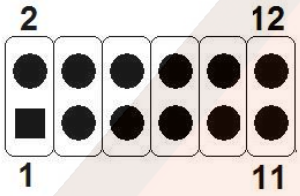
SMB1: SM Bus Pin Header Connector (1x4 with 2.0mm)



Pin No.	Function
1	SMBCK
2	SMBDT
3	+3.3V
4	GND

GPIO1: DIGITAL I/O Pin Header Connector (2x6 with 2.0mm)

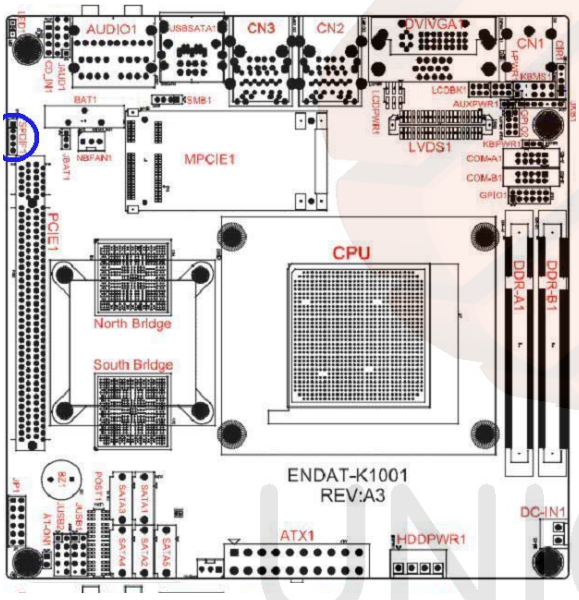




Pin No.	Function	Pin No.	Function
1	+5V	**2**	+3.3V
3	DIO-P30	**4**	DIO-P31
5	DIO-P32	**6**	DIO-P33
7	DIO-P34	**8**	DIO-P35
9	**DIO-P36 ***	**10**	DIO-P37
11	GND	**12**	GND

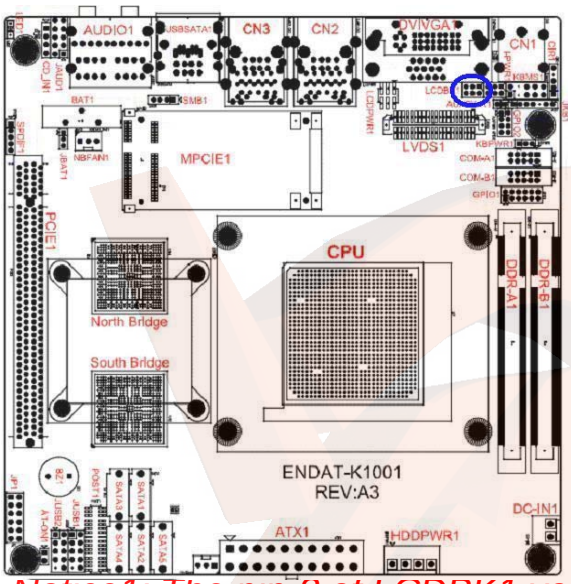
Notice: The DIO-P36 (pin-9 of GPIO1) is an alternate pin of chipsets. It'll output a low frequency clock till the BIOS finished the boot operation.

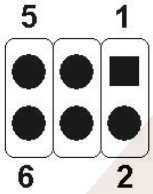
SPDIF1: SPDIF Header (1 x 5 with 2.0mm)



Pin No.	Signal (KB)
1	+5V
2	N.C
3	SPDIF-OUT
4	GND
5	SPDIF-IN

LCDBK1: Inverter Header (2x3 with 2.0mm)

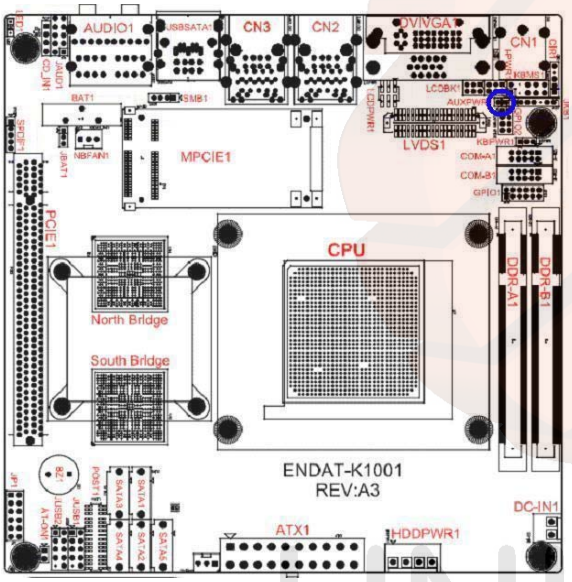




Pin No.	Function	Pin No.	Function
1	VBL	2	VBL
3	INV-BRT	4	BKL ON/OFF
5	GND	6	GND

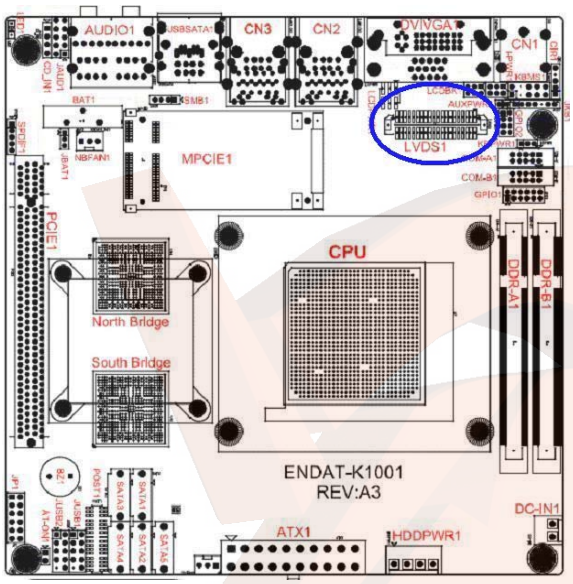
Notice1: The pin-3 of LCDBK1 voltage will change by GPIO2 or S/W control
Notice2: The pin-4 of LCDBK1 voltage will change by I-PWR1 (pin-1, 3, 5)

AUXPWR1: Reserved Power for LCD (1x2 with 2.0mm)



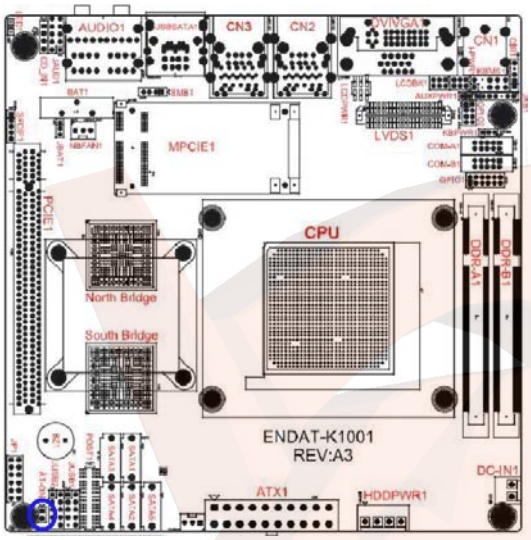
AUXPWR1	Voltage
Pin 1, 2	+3.3V

LVDS1: Dual Channel LVDS (1.25mm)



Pin No.	Signal	Pin No.	Signal
1	VBL (+12V)	**2**	VBL (+12V)
3	GND	**4**	GND
5	DISP.ON/OFF	**6**	GND
7	LCD Power	**8**	LCD Power
9	GND	**10**	GND
11	TxO0+	**12**	TxO0-
13	TxO1+	**14**	TxO1-
15	TxO2+	**16**	TxO2-
17	TxO3+	**18**	TxO3-
19	TxOC+	**20**	TxOC-
21	GND	**22**	GND
23	TxE0+	**24**	TxE0-
25	TxE1+	**26**	TxE1-
27	TxE2+	**28**	TxE2-
29	TxE3+	**30**	TxE3-
31	TxEC+	**32**	TxEC-
33	LCD Power	**34**	LCD Power
35	GND	**36**	GND
37	GND	**38**	GND
39	VBL (+12V)	**40**	VBL (+12V)

AT-ON1: AT Power Mode (1x2 with 2.0mm)



AT-ON1	Mode
Open	ATX mode
Close	AT mode

ATXPWR: ATX Power connector

3.3V	**11**	**1**	3.3V
–12V	**12**	**2**	3.3V
GND	**13**	**3**	GND
PS ON	**14**	**4**	+5V
GND	**15**	**5**	GND
GND	**16**	**6**	+5V
GND	**17**	**7**	GND
–5V	**18**	**8**	POWER OK
+5V	**19**	**9**	5V SB
+5V	**20**	**10**	+12V

DC-IN1: DC Input connector (1x2 with 3.96mm)

1	+V
2	GND

HDDPWR1: DC Output connector (1x4 with 3.96mm)

1	+5V
2	GND
3	GND
4	12V

2-2. Installing Memory

The ENDAT-K1001 offers two 200pin DDR2 SODIMM sockets supporting up to 8GB of memory. The speed of DDR memory can be DDR400, DDR533, DDR667 or DDR800.

2-3. Graphic Memory

The ENDAT-K1001 integrated ATI Radeon™ HD 3200 DirectX® 10 GFX engine with 128MB DDR2 local frame buffer memory (Side Port ; optional feature) and UMA mode (shares system memory up to 1GB). The new interleave operation mode (UMA + Side-Port) for graphics memory, the performance can be improved 10% to 15%.

2-4. Watch Dog Timer

Watchdog Timer (WDT) is a special design for system monitoring to secure the system work normally. WDT has an independent clock from the oscillator and could set time and clear/refresh WDT counter function. When time is up, WDT will send hardware RESET signal to reset system.

Timeout Value Range

-1 to 255

-Second or Minute

UNICORN

Sample code for watch dog timer (using TurboC/C++ 3.0):

```
#include <stdio.h>
#include <dos.h>
#include <dir.h>
void show_ver();
void main()
{
        unsigned int tt;
        clrscr();
        show_ver();
        tt=0;
        while((tt==0)||(tt>255))
        {
                printf("\n\nPlease key in how many seconds you want to reset system (1~255):");
                scanf("%d",&tt);
        }
        outportb(0x2e,0x87);          // Unlock register
        outportb(0x2e,0x01);          // Unlock register
        outportb(0x2e,0x55);          // Unlock register
        outportb(0x2e,0x55);          // Unlock register
        outportb(0x2e,0x07);          // Set Logic Device number pointer
        outportb(0x2f,0x07);// Set Logic Device number

        outportb(0x2e,0x71);    // Set WDT Comtorl reg CRF71
        outportb(0x2f,0x30);// bit 7 CIR interrupt
                                // bit 6 KBC(MOUSE)interrupt
                                // bit 5 KBC (Keyboard)interrupt
                                // bit 0 WDT Status 1:WDT not active / 0: WDT active

        outportb(0x2e,0x72);    // Set active register is CRF72 " WDT Configuration REG"
        outportb(0x2f,0xC0);          // bit 7 WDT Time-out value select 1:Second / 0:Minute.
                              // WDT Output through KRST 1:Enable / 0: Disable

        outportb(0x2e,0x74);    // Set WDT Time-out LSB CRF74
        outportb(0x2f,0x00);//
        outportb(0x2e,0x73);    // Set WDT Time-out MSB CRF73
        outportb(0x2f,tt);           // IF SET  CRF73 Start WDT Time (Clear REG)
        }

void show_ver()
{
        unsigned char tmp0;
        printf("Designed by attila of UNICORN computer corp.  \n2010/10/18  release
version:1.0a\n");
        printf("This program is design for test Watch Dog Timer for ENADT-K1001 (ITE8718F).\n");
}
```

2-5. Digital I/O

1) Pin out of digital I/O header (GPIO1):

Pin No.	Function	Pin No.	Function
1	+5V	**2**	+3.3V
3	DIO-P30	**4**	DIO-P31
5	DIO-P32	**6**	DIO-P33
7	DIO-P34	**8**	DIO-P35
9	**DIO-P36 ***	**10**	DIO-P37
11	GND	**12**	GND

Notice: The DIO-P36 (pin-9 of GPIO1) is an alternate pin of chipsets. It'll output a low frequency clock till the BIOS finished the boot operation.

2) Digital I/O port address:

This function is support by onboard super I/O chip; it can be control easily by change the register of super I/O chip via I/O port "2Eh" and "2Fh". Please see the sample code of below for implement.

Voltage tolerance: +/- 5% with 0V to +5V. (Power On Default High)

Sample code for digital Input (using Turbo C/C++ 3.0):

```
#define input_port 0xf42
        outportb(0x2e,0x87);        // Unlock register
        outportb(0x2e,0x01);        // Unlock register
        outportb(0x2e,0x55);        // Unlock register
        outportb(0x2e,0x55);        // Unlock register
        outportb(0x2e,0x07);        // Set Logic Device number pointer
        outportb(0x2f,0x07);        // Set Logic Device number
        outportb(0x2e,0x27);        // Set GPIO 3
        outportb(0x2f,0xff);        // GP30~37 (Default 00)
        outportb(0x2e,0xC2);        // Set Enable Simple GPIO
        outportb(0x2f,0xff);        // GP30~37 (Default 00)
        outportb(0x2e,0xCA);        // Set GPIO Input Mode / Output Mode
        outportb(0x2f,0x00);        // 0: Inputer ; 1: Output  (Default 00)

read_data=inportb(input_port);   // Read digital input data IO Base Address 0F42
printf("DIO-Input=%02X\n",read_data);   //Show digital input data on screen
```

Register configuration:

Bit No	7	6	5	4	3	2	1	0
Map	P37	P36	P35	P34	P33	P32	P31	P30

2-6. LCD Backlight ON/OFF Control

1) Inverter Power/ON/OFF Signal level select:

I-PWR1 (Pin2, 4, 6): LCD Backlight Voltage Select (2x3 with 2.0mm)

Voltage	+5V	+12V *
I-PWR1	4-6	2-4

I-PWR1 (Pin1, 3, 5): Inverter ON/OFF Level Select (2x3 with 2.0mm)

Voltage	+3.3V *	+5V
I-PWR1	1-3	3-5

2) Backlight ON/OFF Control port address:

This is alternate function with VBIOS (VESA) to offering an easy way to control the LCD backlight ON and OFF as need. Please follow the instructions of below for more detail in operation.

Sample code for backlight on/off control (using Turbo C/C++ 3.0):

```
#define input_port 0xf40
        outportb(0x2e,0x87);        // Unlock register
        outportb(0x2e,0x01);        // Unlock register
        outportb(0x2e,0x55);        // Unlock register
        outportb(0x2e,0x55);        // Unlock register
        outportb(0x2e,0x07);        // Set Logic Device number pointer
        outportb(0x2f,0x07);        // Set Logic Device number
        outportb(0x2e,0x25);        // Set Multi-Function Pin for GPIO Set1
        outportb(0x2f,0x10);        // GP10~17 (Default 01)
        outportb(0x2e,0x2A);        // Set Ext Multi-Function Pin
        outportb(0x2f,0x10);        // Set Bit 1: GPIO / 0:PCIRST
        outportb(0x2e,0xC0);        // Set Enable Simple GPIO
        outportb(0x2f,0x10);        // GP10~17 (Default 01)
        outportb(0x2e,0xB0);        // Set GPIO Pin Polarity
        outportb(0x2f,0x10);        // GP10~17(Default 00) 1:Inverting/0: Non-Inverting
        outportb(0x2e,0xC8);        // Set GPIO Input Mode / Output Mode
        outportb(0x2f,0x10);        // 0: Inputer ; 1: Output  (Default 00)
        outportb(0xf40,0xnn);       // Set active register is  IO Base Address 0F40  "default 2F"
                                    // ; bit4 = 0h ➔ Backlight On
                                    // ; bit4 = 1 ➔ Backlight Off
```

Register configuration:

Bit No	7	6	5	4	3	2	1	0
Map	NA	NA	NA	BKL CTRL	NA	NA	NA	NA

2-7.LCD Brightness Control

1) Inverter Brightness Digital level select:

LCDBK1: Inverter Header (2x3 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	VBL	2	VBL
3	INV-BRT	4	BKL ON/OFF
5	GND	6	GND

2) Brightness Control port address:

This is alternate function with VBIOS (VESA) to offering an easy way to control the LCD backlight ON and OFF as need. Please follow the instructions of below for more detail in operation.

Sample code for brightness control (using Turbo C/C++ 3.0):

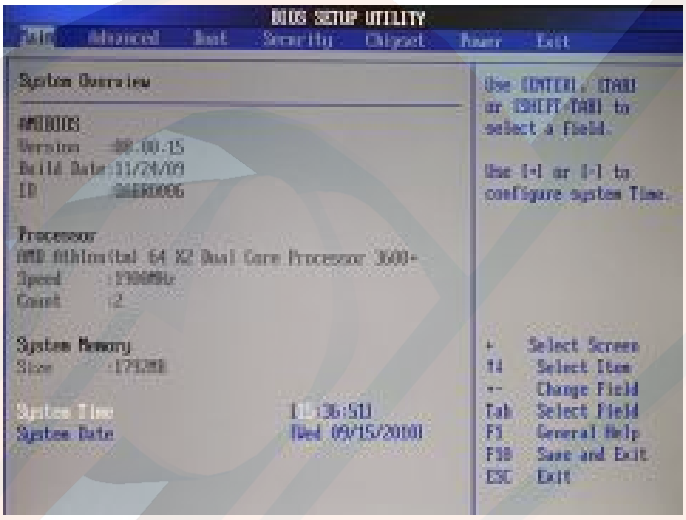
```
#define input_port 0xf40
        outportb(0x2e,0x87);        // Unlock register
        outportb(0x2e,0x01);        // Unlock register
        outportb(0x2e,0x55);        // Unlock register
        outportb(0x2e,0x55);        // Unlock register
        outportb(0x2e,0x07);        // Set Logic Device number pointer
        outportb(0x2f,0x07);        // Set Logic Device number
        outportb(0x2e,0x25);        // Set Multi-Function Pin for GPIO Set1
        outportb(0x2f,0x0F);        // GP10~17 (Default 01)
        outportb(0x2e,0x2A);
        outportb(0x2f,0x0F);        // Set Bit 1: GPIO / 0:PCIRST
        outportb(0x2e,0xC0);        // Set Enable Simple GPIO
        outportb(0x2f,0x0F);        // GP10~17 (Default 01)
        outportb(0x2e,0xB0);        // Set GPIO Pin Polarity
        outportb(0x2f,0x07);        // GP10~17(Default 00) 1:Inverting/0: Non-Inverting
        outportb(0x2e,0xC8);        // Set GPIO Input Mode / Output Mode
        outportb(0x2f,0x07);        // 0: Inputer ; 1: Output
        outportb(0xf40,0xnn);       // Set active register is  IO Base Address 0F40  "default 30"
                                    // ; 0f40 = 30h ➔ Out +0V / 0f40 = 38h ➔ Out +5V
                                    // ; 0f40 = 39h ➔ Out +2.54V / f40 = 3Ah ➔ Out +1.73V
                                    // ; 0f40 = 3bh ➔ Out +1.29V / f40 = 3ch ➔ Out +1.04V
                                    // ; 0f40 = 3dh ➔ Out +0.86V / f40 = 3eh ➔ Out +0.74V
                                    // ; f40 = 3fh ➔ Out +0.65V
```

Register configuration:

Bit No	7	6	5	4	3	2	1	0
Map	NA	NA	NA	NA	P13	P12	P11	P10

Chapter 3. AMI BIOS SETUP

BIOS Setup Utility



Use the BIOS CMOS setup program to modify the system parameters to reflect the environment installed in your system and to customize the system as desired. Press the <DEL> key to enter into the BIOS CMOS setup program when you turn on the power. Settings can be accessed via arrow keys. Press <Enter> to choose an option to configure the system properly.

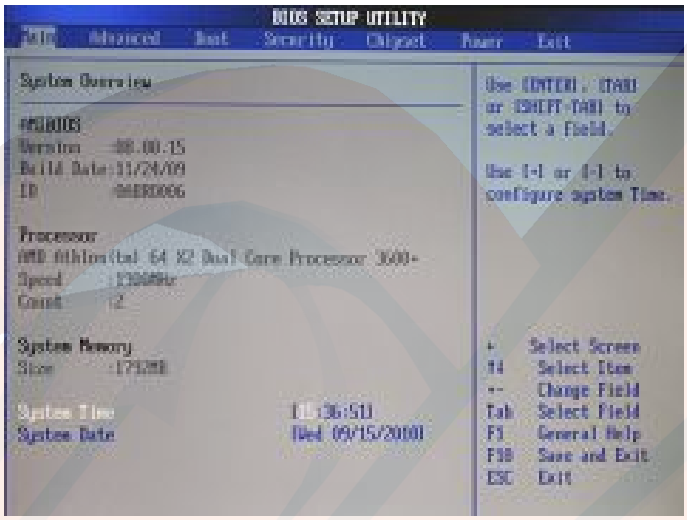
In the main menu, press F10 or “Save Changes and Exit” to save your changes and reboot the system. Choose “Discard Changes and Exit” to ignore the changes and exit the setup procedure. Pressing <ESC> at anywhere during the setup will return to the main menu.

All of the above CMOS BIOS items require board knowledge on PC/AT system architecture. Incorrect setup could cause system malfunctions.

UNICORN

3-1. Main

The Standard Setup is used for the basic system configuration, such as date etc.



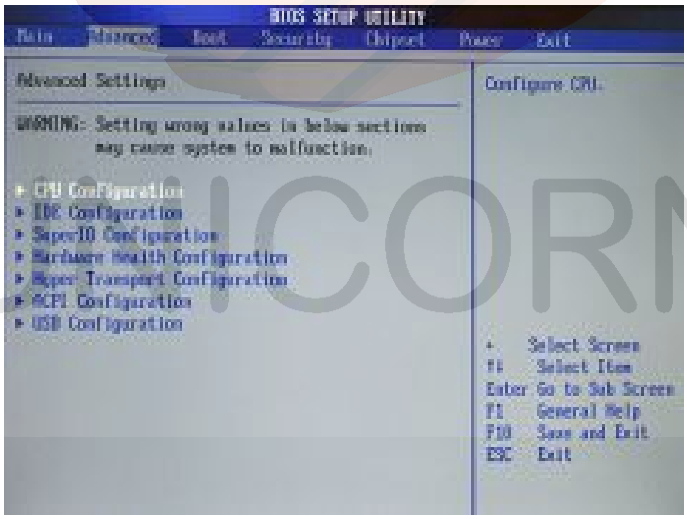
˙AMIBIOS, Processor, System Memory.
These Items show the firmware and hardware specifications.

˙System Time
This setting allows you to set system time. The time format is Hour:Minute:Second.

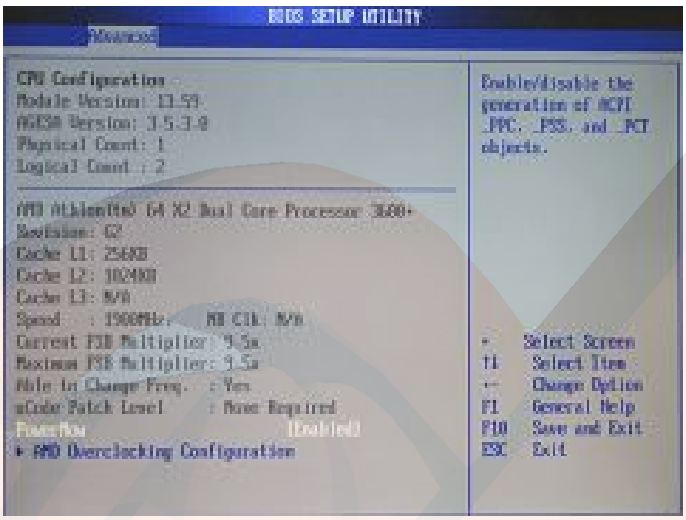
˙System Date
This setting allows you to set system Date. The time format is Momth:Day:Year.

3-2. Advanced

Use this menu to setup items of special feature. CPU, IDE, SuperIO, Hardware Health, ACPI, MPS, PCI Express, USB Configuration.

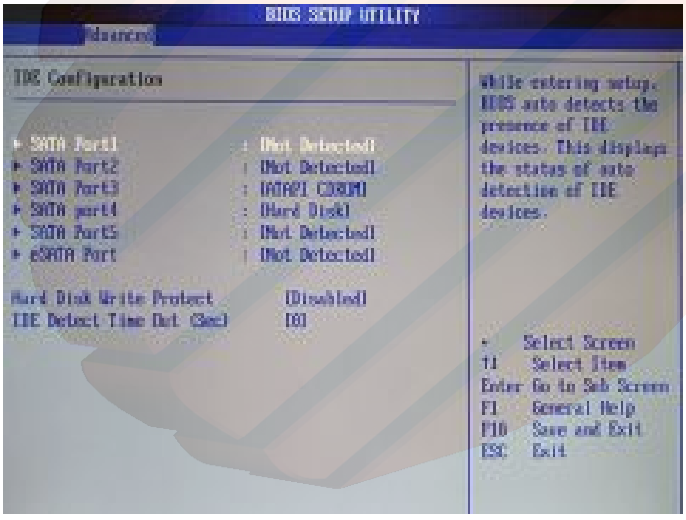


CPU Configuration



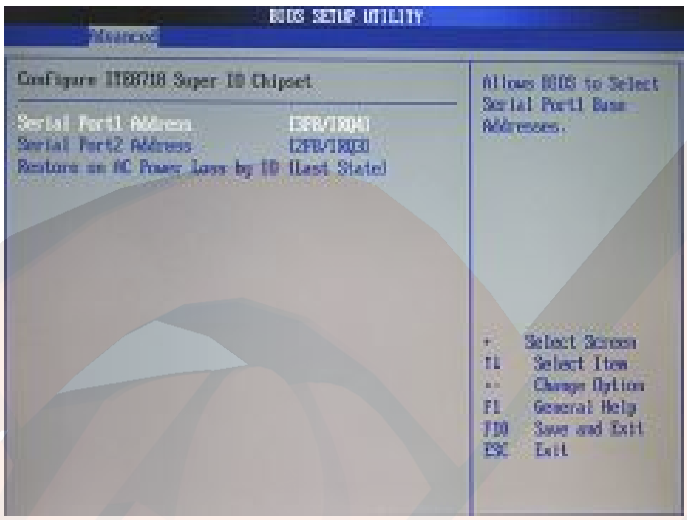
PowerNow
This setting enables/disables the generation of ACPI_PPC, _PSS, and _PCT objects.

IDE Configuration


BIOS SETUP UTILITY
Advanced
IDE Configuration
SATA Port1 : [Not Detected]
SATA Port2 : [Not Detected]
SATA Port3 : [ATAPI CDROM]
SATA port4 : [Hard Disk]
SATA Port5 : [Not Detected]
eSATA Port : [Not Detected]
Hard Disk Write Protect [Disabled]
IDE Detect Time Out (Sec) [0]
While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.
Select Screen
Select Item
Enter Go to Sub Screen
General Help
Save and Exit
Exit

UNICORN

SuperIO Configuration

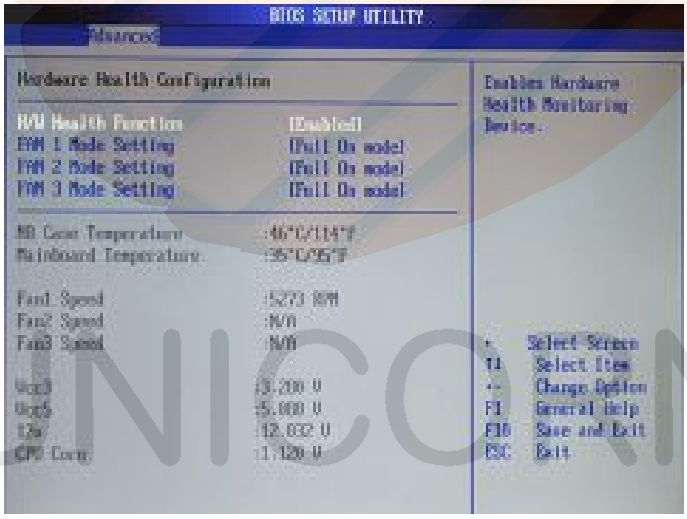


Serial Port 1/2 Address
Select an address and a corresponding interrupt for the specified serial port.

Restore on AC Power Loss by IO

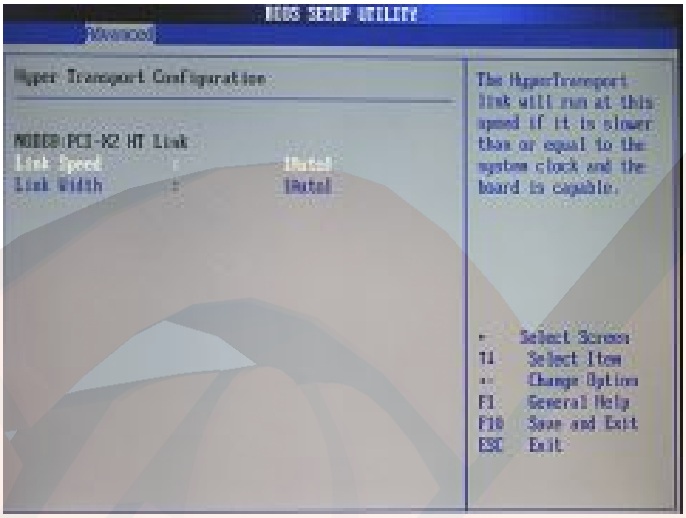
Power Off	Leaves the computer in the power off state.
Power On	Leaves the computer in the power on state.
Last State	Restores the system to the previous status before power failure or interrupt occurred.

Hardware Health Configuration



These items display the current status of all monitored hardware devices / components such as voltages, temperatures and all fans' speeds.

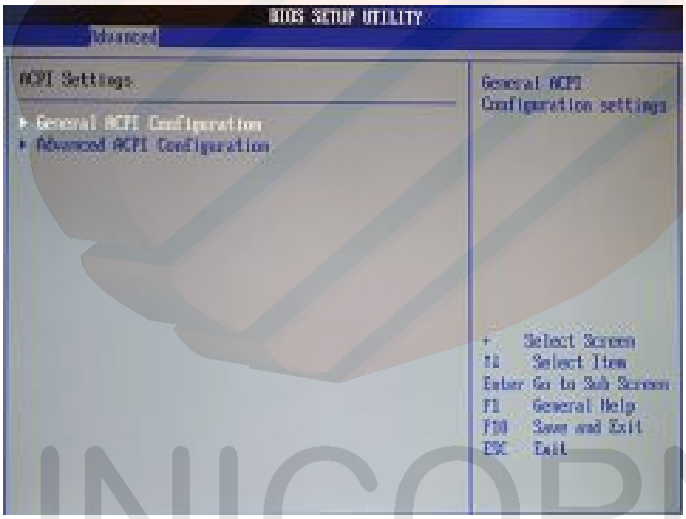
Hyper Transport Configuration



HT Link Speed
This item allows you to set the Hyper-Transport Link Speed. Setting to “Auto” the system will detect the HT link Speed automatically.

HT Link Control
These Items allow you to set the Hyper-Transport Link width. Setting to “Auto” the system will detect the HT link width automatically.

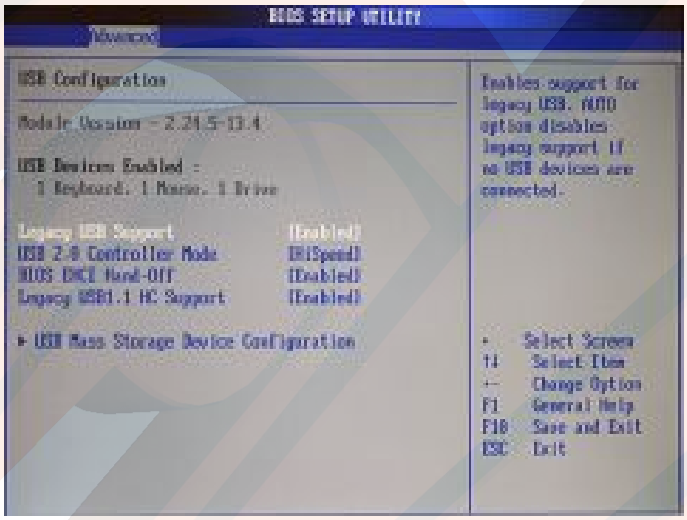
ACPI Configuration



Suspend Mode
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

C1E Support
When the C1E Support (Enhanced Halt Powerdown State) is enabled, the processor will transition to a lower core to bus ratio and lower voltage ID driven by the processor to the voltage regulator before entering Halt Powerdown State (C1). Not all porcessors support Enhanced Halt Powerdown State (C1E).

USB Configuration


BIOS SETUP UTILITY
Advanced
USB Configuration
Module Version - 2.24.5-13.4
USB Devices Enabled :
1 Keyboard, 1 Mouse, 1 Drive
Legacy USB Support [Enabled]
USB 2.0 Controller Mode [HiSpeed]
BIOS EHCI Hand-Off [Enabled]
Legacy USB1.1 HC Support [Enabled]
▶ USB Mass Storage Device Configuration
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Legacy USB Support
Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

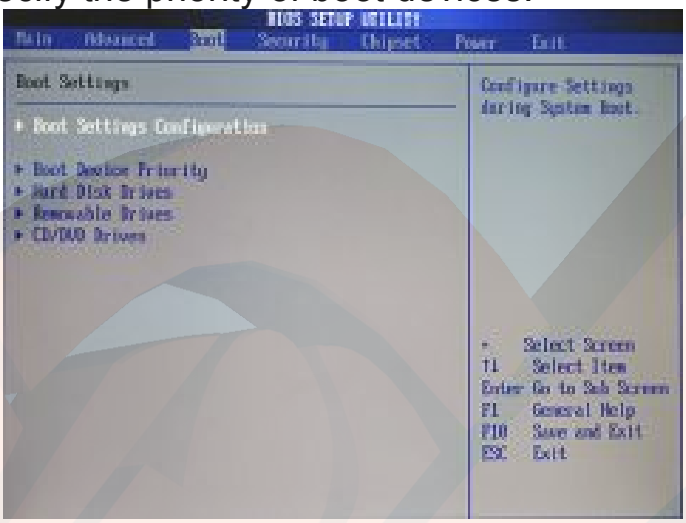
USB 2.0 Controller Mode
This setting specifies the operation mode of the onboard USB 2.0 controller.

USB Mass Storage Device Configuration:
USB Mass Storage Reset Delay
This setting controls the number of seconds the POST waits for the USB mass storage device after the start unit command is sent.

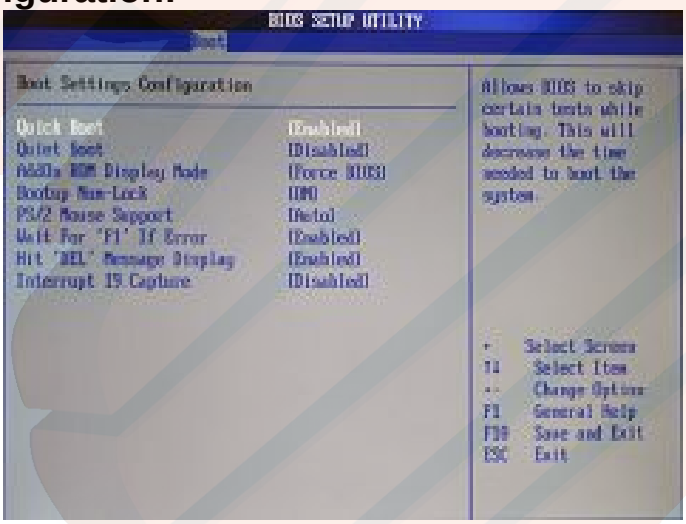
Emulation Type
This setting enables you to set the type of device you want the USB mass storage device to emulate.

3-3. Boot

Use this menu to specify the priority of boot devices.



Boot Settings Configuration:


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
Add-On ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Select Screen
Select Item
Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during bootup for faster system boot.

Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.

Bootup Num-Lock

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

PS/2 Mouse Support
Select support for PS/2 Mouse.

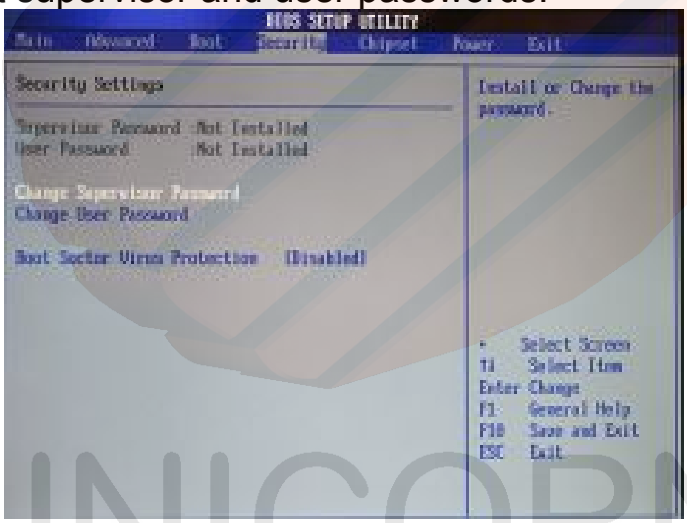
Wait For "F1" If Error
When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

Boot Device Priority
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

Removable Drives
This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <-> or <PageUp>, <Page-Down> key to move it up/down in the priority list.

3-4. Security

Use this menu to set supervisor and user passwords.



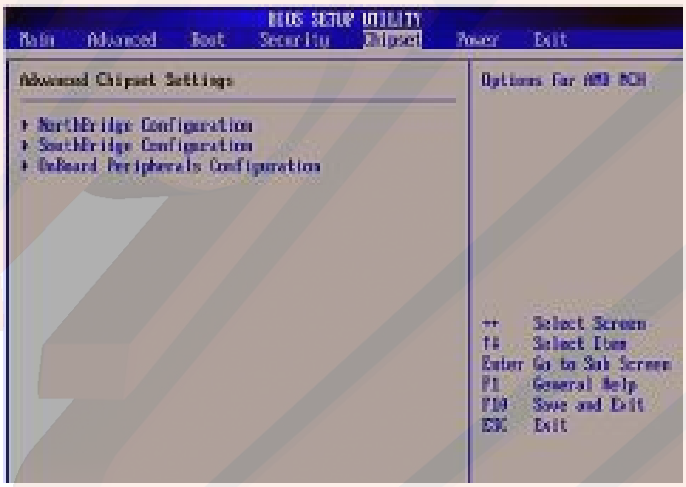
Supervisor Password / Change Supervisor Password
Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

User Password / Change User Password
User Password controls access to the system at boot. These settings allow you to set or change the user password.

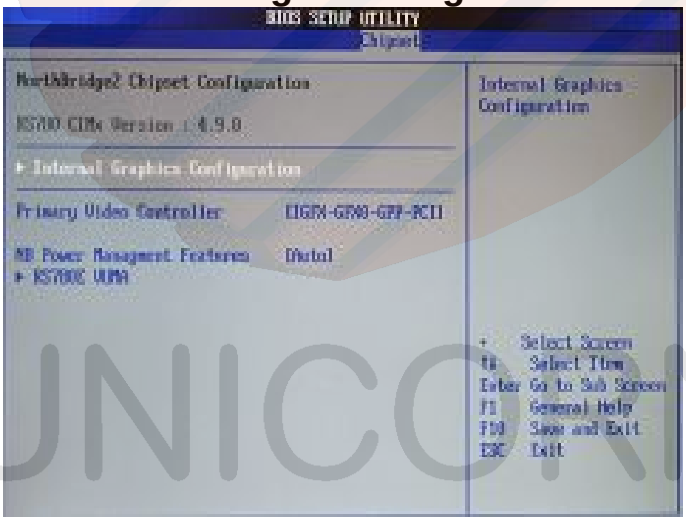
Boot Sector Virus Protection
This function protects the BIOS from accidental corruption by unauthorized users or computer viruses.

3-5. Chipset

This menu controls the advanced features of the onboard Northbridge and Southbridge.



NorthBridge2 Configuration



Internal Graphics Configuration:

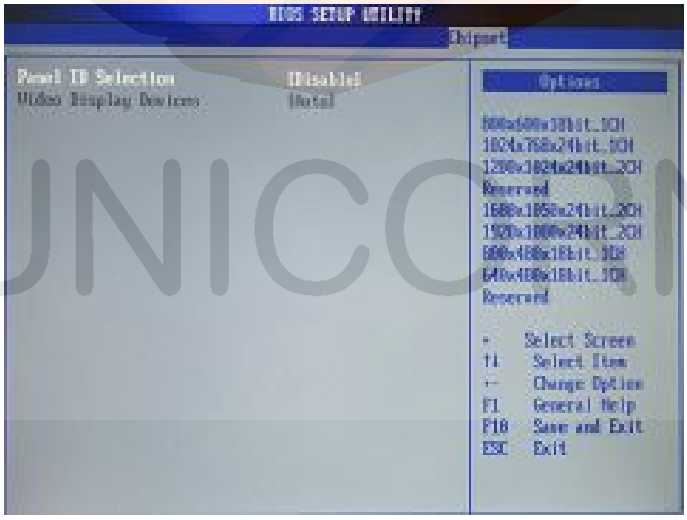
Internal Graphics Mode
This setting specifies the internal graphics mode.

UMA Frame Buffer Size
Frame Buffer is the video memory that stores data for video display (frame). This field is used to determine the memory size for Frame Buffer. Larger frame buffer size increases video performance.

Side-Port Clock Speed
This setting is selecting the clock speed of the onboard video memory.

Primary Video Controller
This setting specifies which video controller is your primary graphics adapter.

RS780E VUMA

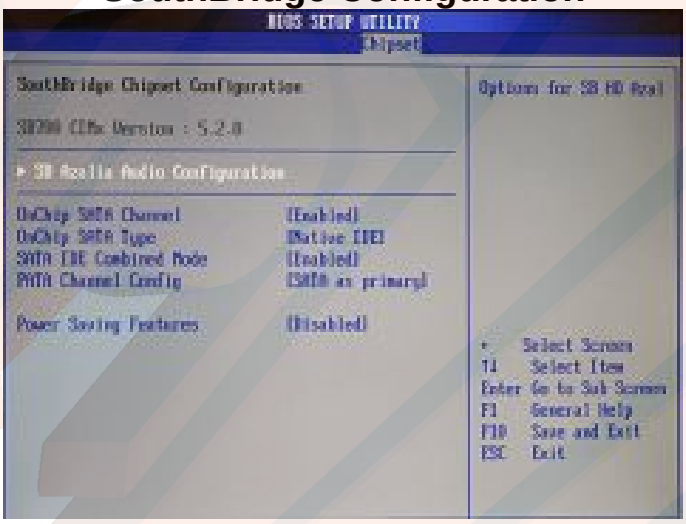


Panel ID Selection

800x600x18bit_1CH	1920x1080x24bit_2CH	Reserved
1024x768x24bit_1CH	800x480x18bit_1CH	Reserved
1280x1024x24bit_2CH	640x480x18bit_1CH	Reserved
1366x768x24bit_1CH	Reserved	Reserved
1680x1050x24_2CH	Reserved	LCD Disable.

Select appropriate LCD type according to the above Panel ID. If the LCD panel spec is not suitable for above list, please contact UNICORN for OEM BIOS/VBIOS request.

SouthBridge Configuration



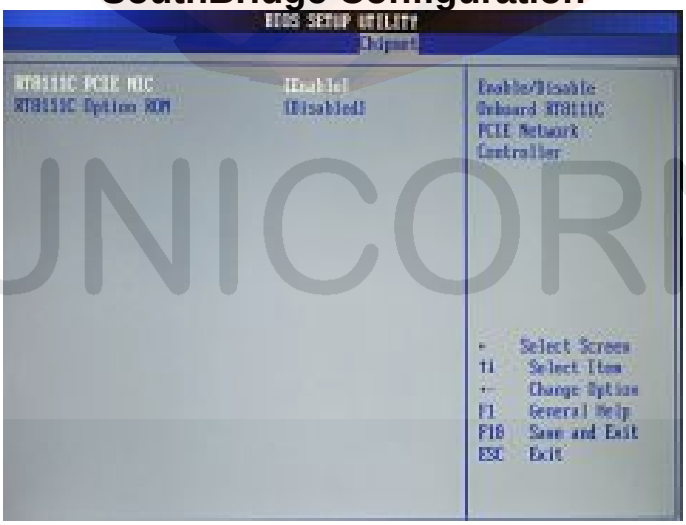
HD Audio Azalia Device

This setting enables/disables the high-definition audio device.

Onchip SATA Channel, Onchip SATA Type, SATA IDE Combined Mode

These settings control the onboard SATA controller.

SouthBridge Configuration

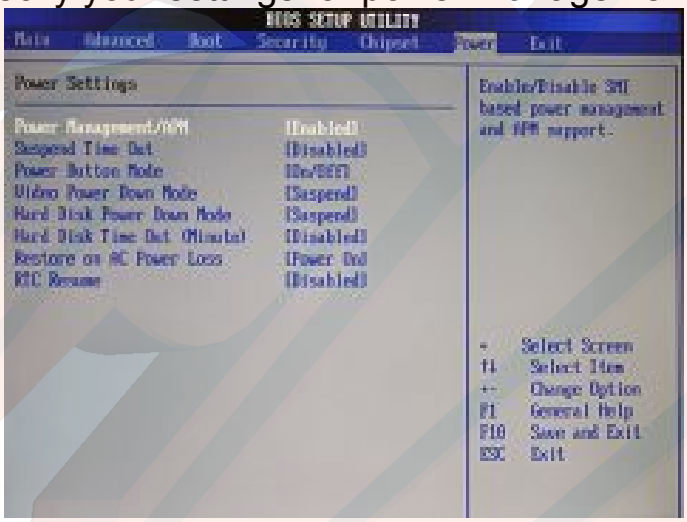


Realtek 8111C PCIE NIC
This setting enables/disables the onboard LAN controller.

Realtek 8111C Option ROM
The items enable or disable the initialization of the onboard LAN Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

3-6. Power

Use this menu to specify your settings for power management.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Power Exit
Power Settings
Power Management/APM [Enabled]
Suspend Time Out [Disabled]
Power Button Mode [On/Off]
Video Power Down Mode [Suspend]
Hard Disk Power Down Mode [Suspend]
Hard Disk Time Out (Minute) [Disabled]
Restore on AC Power Loss [Power Off]
RTC Resume [Disabled]
Enable/Disable ACPI based power management and APM support.
↑↓ Select Screen
Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Power Management/APM
Setting to [Enabled] will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock.

Resume On PME
When setting to [Enabled], this setting allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

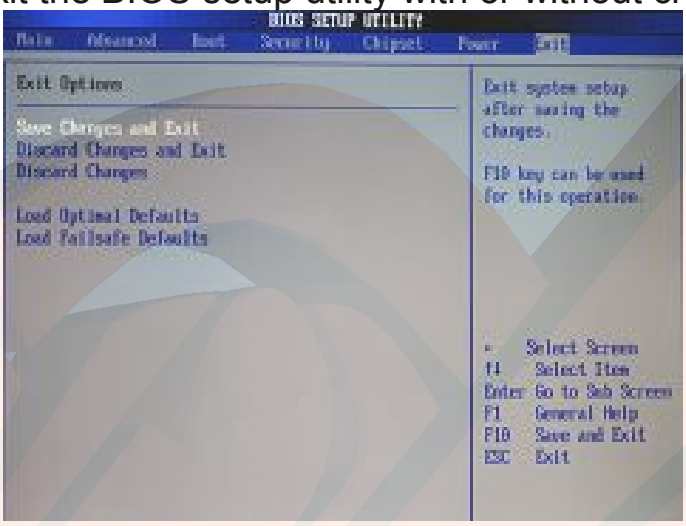
RTC Resume
When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

Restore on AC Power Loss

Power Off	Leaves the computer in the power off state.
Power On	Leaves the computer in the power on state.
Last State	Restores the system to the previous status before power failure or interrupt occurred.

3-7. Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.



Save Changes and Exit
Save changes to CMOS and exit the Setup Utility.

Discard Changes and Exit
Abandon all changes and exit the Setup Utility.

Discard Changes
Abandon all changes and continue with the Setup Utility.

Load Optimal Defaults
Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

Load Failsafe Defaults
Use this menu to load the default values set by the BIOS vendor for stable system performance.

UNICORN

Chapter 4. VGA, LCD and drivers

4-1. Graphic controller Feature

The ENDAT-K1001 integrated ATI Radeon™ HD 3200 graphics with ATI Avivo™ HD technology provides excellent graphics performance for most embedded applications. If additional graphics performance is necessary, ATI Hybrid CrossFireX™ technology can be leveraged to not only upgrade graphics performance but combine the performance of both the integrated ATI Radeon graphics and a discrete ATI Radeon™ graphics processor to substantially boost graphics performance.

The ATI Radeon™ HD 3200 graphics core employs a unified shader architecture to deliver optimal 3D performance across the whole spectrum of 3D applications. This future-proof core ensures compatibility with both current and upcoming 3D applications.

The Radeon™ HD 3200 Graphics core main features include:

- DirectX® 10
- OpenGL 2.0
- UVD (Universal Video Decoder) 2.0 Hardware decode of most common HD Hardware codec (MPEG-2, H.264 and VC-1).
- ATI Hybrid CrossFireX™ technology
- Shader Model 4.0 geometry and pixel support in a unified shader architecture
- Dual Independent Display Support
- LVDS support up to 1920 x 1200 with 18/24/36/48
- DVI support up to 2560 x 1600 with dual link DVI
- CRT support up to 2048 x 1536 (4:3) or 2560 x 1440 (16:9)

4-2. Driver Utility Installation Guide

1. When finishing the installation of Windows XP, please install the relative AMD display and AUDIO driver manually for compliance compatibility of hardware environment.

2. Please contact sales department of UNICORN for Embedded OS user driver (Windows CE and Windows XP embedded). All of embedded OS driver is not be included in any versions of driver CD-ROM from UNICORN.

Please download or check from AMD Web site: www.amd.com for more information or last versions of driver as needs!

UNICORN

Appendix A: FLASH Memory Utility

Using this utility to update the system BIOS from a disk file to the on board Flash memory. Be aware the improper change of the system BIOS will cause the system to malfunction.

Using utility as follows:

1. Insert the FLASH memory utility distribution floppy diskette in drive A:
2. At the DOS prompt, type A:> AFUD4310.EXE BIOS.rom /C /X /REBOOT <Enter>
3. For upgrade BIOS procedure, please refer to our web site:
   http://www.unicorn-computer.com.tw

**** Please turn off system and clear CMOS data by JBAT1.***

**** Please restart your system and load setup default .***

UNICORN

Appendix B: LIMITED WARRANTY

Standard Two years limited warranty on all our ENDAT series all-in-one motherboards and embedded board. Products that become defective during the warranty period shall be repaired, or subject to manufacturer's option, replaced. The limited warranty applies to normal proper usage of the hardware and does not cover products that have been modified or subjected to unusual electrical or physical stress. Unicorn Computer Corp is not liable to repair or replace defective goods caused by improper using or use of unauthorized parts. The following situations will be charged:

1. The products during the warranty but defective caused by improper using or artificial external pressure and result in the components damages. According to the damage situation, the manufacturer has the rights to decide to repair or not. The manufacturer will charge the parts/repair cost and the returning shipping charge.
2. The products out of warranty will charge the parts/repair cost and the returning shipping charge as per the repair status.
3. The manufacturer has the rights to decide to repair or not based on the stock of parts for the products which are phased out of the production.
4. Please e-mail or fax the RMA Service Request Form when have the defective products.

UNICORN

RMA SERVICE REQUEST FORM

When requesting RMA service, please fill out this “RMA Service Request Form”. This form needs to be shipped with your returns. Service cannot begin until we have this information.

RMA NO.:

Company:	Person to Contact:
Phone No:	Purchase Date :
Fax No. :	Applied Date :
Return Shipping Address:	

Model No.	Serial No.	Problem Code	Remark

UNICORN

- **Issue Code of defect.**

01	Second Times R.M.A.	11	Memory Socket Bad
02	No Screen (No Boot)	12	Hang Up Hardware
03	VGA (Display) Fail	13	Hang Up Software
04	CMOS Data Lost	14	PCB Problem
05	FDC Fail	15	CPU Socket Bad
06	HDC Fail	16	LAN Fail
07	Bad Slot	17	Audio Fail
08	BIOS Problem	18	Serial Port Fail
09	Keyboard Controller Fail	19	Parallel Port Fail
10	Cache RAM Problem	20	Others

Please specify the following when returning the RMA boards:
(1) Hardware Configuration (2) OS or Software (3) Testing Program

_____
Authorized Signature

UNICORN